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THE AGRICULTURAL COLLEGE
EXTENSION BULLETIN

Vol. VIII JANUARY, 1913 No. 5

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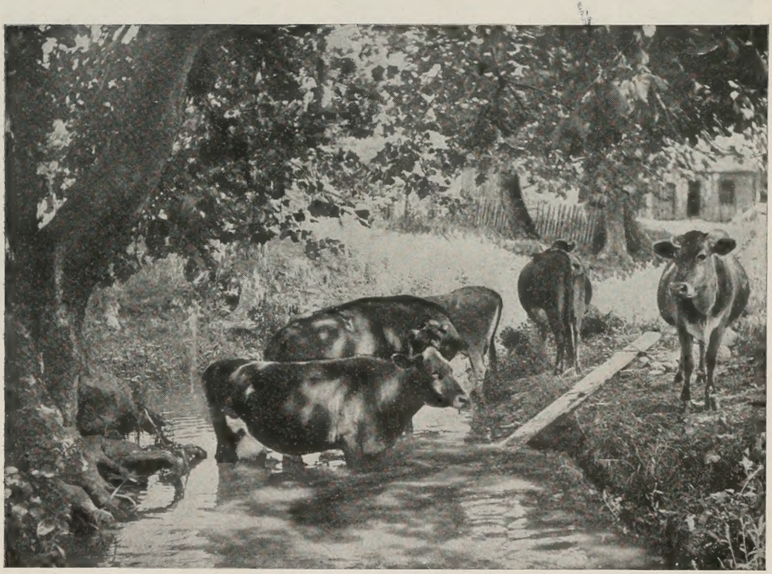
HOME BUTTER MAKING

By A. S. NEALE



PUBLISHED MONTHLY BY THE OHIO STATE UNIVERSITY
COLUMBUS

Entered as Second-Class Matter, November 17, 1905, at the Post Office at Columbus, Ohio, under Act of Congress, July 16, 1894

" 'Cause if you or me pulls the handles, why
The moo-cow-moo says it hurts,
But the hired man he sits down clost by,
En squirts en squirts en squirts"

Evening at the Farm

Over the hill the farm-boy goes;
His shadow lengthens along the land,
A giant staff in a giant hand;
In the poplar-tree, about the spring,
The katydid begins to sing;
  The early dews are falling;
Into the stone heap darts the mink;
The swallows skim the river's brink;
And home to the woodland fly the crows,
When over the hill the farm-boy goes,
  Cheerily calling,
"Co', boss! Co', boss! Co'! Co'! Co'!"
Farther, farther, over the hill,
Faintly calling, calling still,
"Co', boss! Co', boss! Co'! Co'!"

Into the yard the farmer goes,
With grateful heart, at the close of day;
Harness and chain are hung away;
In the wagon-shed stand yoke and plow;
The straw's in the stack, the hay's in the mow,
  The cooling dews are falling:
The friendly sheep his welcome bleat,
The pigs come grunting to his feet,
The whinnying mare her master knows,
When into the yard the farmer goes,
  His cattle calling:
"Co', boss! Co', boss! Co'! Co'! Co'!"
While still the cow-boy, far away,
Goes seeking those that have gone astray—
"Co', boss! Co', boss! Co'! Co'!"

Now to her task the milkmaid goes,
The cattle come crowding through the gate,
Lowing, pushing, little and great;
About the trough, by the farm-yard pump,
The frolicksome yearlings frisk and jump,
  While the pleasant dews are falling:
The new milch heifer is quick and shy,
But the old cow waits with a tranquil eye,
And the white stream into the bright pail flows,
When to her task the milkmaid goes,
  Soothingly calling,
"So, boss! So, boss! So! So! So!"
The cheerful milkmaid takes her stool,
And sits and milks in the twilight cool,
Saying, "So! So, boss! So! So!

—J. T. Trowbridge

Home Butter Making

By A. S. NEALE

Poor butter is usually found as a companion to poor cows (which are improperly fed and cared for,) thus combining a low priced product with low production, a most unprofitable combination. Fancy dairy butter usually commands from ten to twenty cents more per pound than the low grade. The average cow of Ohio produces 160 pounds of butter per year. A difference of ten cents a pound means a gain of $16 per year on the income from each cow. A fairly good cow will produce 300 pounds of butter in a year. There are many herds of cows in Ohio producing annually 400 pounds of butter per cow. The following table will give an idea of the difference of income from good and poor butter, made from good and poor cows, if the best grade of butter is worth 30 cents a pound:

	Poor Butter @ 20c per lb	Good Butter @ 30c per lb
Income from cow producing 160 pounds of butter per year........................	$32 00	$48 00
Income from cow producing 300 pounds of butter per year........................	$60 00	$90 00
Increase value of good butter from good cow, per year		$58 00

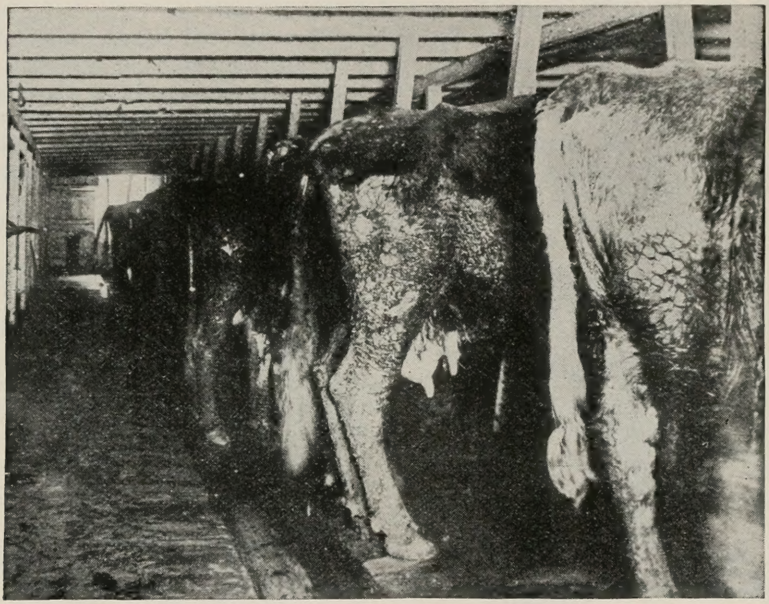
It will be seen that, where good butter is made from good cows, the income is almost three times as great as the income from poor butter from poor cows. It must also be noted that the amount of skim milk will be almost twice as great from the good cow, and hence an additional source of income from her. Why, then, keep poor cows and make the product into low priced butter?

The quality of the butter made on the farm is a good indicator of the character of the individual responsible for it. Poor butter is always the result of careless, shiftless work. Good butter is the product of care and industry. Likewise, the production of high class cows, and the care necessary to cause them to produce 300 pounds of butter per year, can come only from intelligent efforts. Unless it is possible to keep good cows, to care for them so as to make them do their best, and to care for the products so as to turn out the best grade of butter, farm butter-making will be found unpleasant, unprofitable, and uncreditable.

There are a number of details connected with successful butter-making which must receive proper attention. The first requisite is good milk. Good milk is simply clean milk drawn from healthy cows, and handled so as to be kept from contamination. Careless, filthy methods of handling milk always cause the butter-maker trouble. Fancy butter cannot be made from such milk even by the most skillful butter-maker.

The various changes that occur in milk are caused by bacteria. In fact, these minute organisms are at the bottom of nearly all the changes that occur in nature. The farmer is coming in touch with their work continually. The decay of manure, of organic matter in the soil, of fruit and vegetables; the power of legumes to enrich the soil by gathering nitrogen from the air, and the majority of animal diseases, are only a few of the many results of bacterial action with which the farmer must deal. It will readily be seen that he should know something of practical bacteriology.

There are several different families of bacteria found in milk, each of which causes a different change in the condition of it. The most common of these is the lactic-acid family. This sort brings about the souring of milk and is, if properly controlled, of much value to the butter-maker. The sweet curdling of milk, ropy or stringy milk, gassy milk, the bluish or reddish color of milk, are each caused by a special family of bacteria. Other bacteria attack the organic compounds in milk, causing the decay of the organic matter and making putrid milk. There are other changes in milk also brought about by bacterial action.



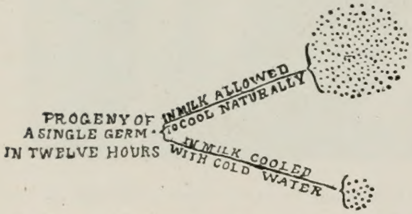
Filthy condition of cattle due in part to insufficient bedding. This condition is one source of filth in milk.

In addition to the bacteria ordinarily found in milk, there may be disease germs. Epidemics of typhoid fever and other contagious diseases have frequently been traced to milk depots or dairy farms. The germs of bovine tuberculosis are often found in milk, where the dairy herd is infected with this disease.

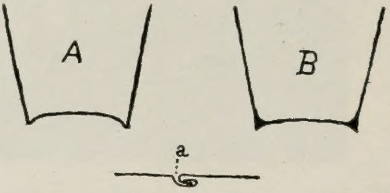
Bacteria are very numerous, especially in dark, filthy stables. They are found in large numbers in the air of such barns. Every particle of dust is laden with them. The dust settles on the cows and the milkers' clothes, and in this way gets into the milk. The manure also contains innumerable germs and, unless cows are kept clean, more or less of this filth finds its way into the milk. This is the most common source of infection by the germs of bovine tuberculosis.

It is practically impossible to produce sterile milk, so numerous are the germs in even the best of barns where all precautions against contamination are observed. A cubic centimeter of milk is equal to sixteen drops. Less than 1000 bacteria per cubic centimeter is rare, while in milk produced in an unsanitary manner, the number may be several millions. The following simple rules, if observed, will reduce the bacterial count and hence improve the quality of the milk:

1. Keep clean, healthy cows. The dirt that falls from the cow into the milk cannot be entirely strained out.
2. Maintain clean, well lighted, well ventilated barns, where dust and cobwebs are swept down from the walls and ceiling.
3. Do not feed until after milking. Avoid anything that has a tendency to stir up the dust, especially just before milking.
4. Wipe the flanks and udder of the cow with a damp cloth, in order to get rid of the fine particles of dust that will otherwise be brushed off and fall into the milk.
5. Milk with clean, dry hands, and wear clean clothes while milking.
6. Use a pail with small opening and have the seams flushed with solder, so that the pail may be easily cleaned.
7. Provide the cows with clean water and avoid muddy or filthy yards through which they must travel.
8. Remove the milk from the stable as soon as drawn from the cow, because it will readily absorb the stable odors.


PROGENY OF
A SINGLE GERM
IN TWELVE HOURS
IN MILK ALLOWED TO COOL NATURALLY
IN MILK COOLED WITH COLD WATER

A diagram showing how temerature effects the growth of bacteria in milk.



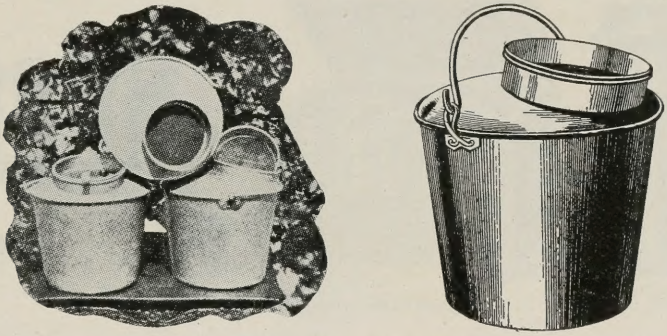
A diagram showing good and bad joints in milk pails.

Even with all this care, it is impossible to produce germ-free milk, and were it possible, the milk could not be kept so. The only practical thing to do, after using the above precautions, is to keep the milk in such a condition that the germs cannot multiply. This is best accomplished by cooling as soon as the milk is drawn. It has been found that, where milk is allowed to cool naturally and is kept at a temperature of 70 degrees, one bacterium will have increased to 700 in twelve hours, while if the milk is cooled to 50 degrees at once and held there, a single germ in the same time will have increased to only 7. As milk for churning must be kept for some time, cooling is very important.

In making butter, when the centrifugal separator is used, it is better to separate the milk before cooling, thus making it possible to feed the skim milk while still warm, and reducing the loss in separation as well as the labor of cooling. The cream should be cooled at once and kept in cold water until ready to sour, or ripen, for churning. Avoid mixing the warm with the cold cream.

Common sources of infection of milk are improperly cared for pails, strainers, separators, etc. These utensils should be rinsed with cold water, washed thoroughly with warm water and a washing powder (use a stiff brush, not a dish cloth), sterilized by the use of boiling water or steam, and placed in the sunlight, the most powerful germ destroyer that nature provides.

Too much care cannot be taken in washing the separator. In order to make sales, unscrupulous agents often advise flushing out the bowl with warm water after the milk has been run through and allowing the machine to stand until used again, washing only once or twice a week. A machine so treated affords an excellent opportunity for the development of bacteria, and the cream coming from it will be so infected as to make impossible the production of fancy butter from it. The skim milk may also be infected to such an extent as to render it unsafe as a food for young calves. The separator should always be washed and sterilized after using.



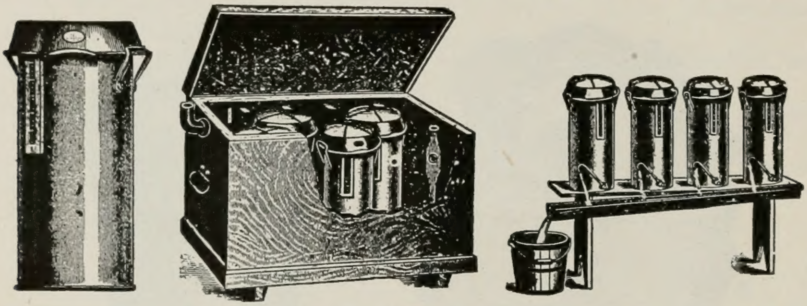
Types of sanitary milk buckets.

The best method of skimming is by the use of the hand or power separator. This method has several advantages over any other. First, there is less loss in skimming. The loss of butter fat with the use of a machine should not exceed one-tenth of a pound to 100 pounds of milk. Thus the loss in skimming 6000 pounds of milk, the output of a fairly good cow in one year, would amount to only six pounds of butter fat. With any other method, the loss is four or more times as great, thus there would be a loss of at least eighteen pounds more fat than with a separator. This loss will amount to five or more dollars per cow per year; the loss from only a few cows will be sufficient to buy a new machine every year or two.

Another important advantage in the separator is the quality of cream secured. This greatly simplifies the problem of making good butter. The fresh cream from the machine is quickly cooled, and easily kept cool and sweet until enough has been gathered for a churning. Keeping the whole milk cool till the cream rises is much more difficult, and unless this is done, the quality of the butter will be injured. In any event, the cream from hand skimming will be older when churned than that skimmed with a machine.

The labor involved in using a separator is less than that required with the setting system. There is only about one-sixth as much milk to cool and store, therefore a correspondingly less amount of storage room and number of utensils will be needed. Caring for the whole amount of milk will require more labor than turning and washing the machine. The fresh skim milk is also better for calf feeding than that obtained by any other method of skimming.

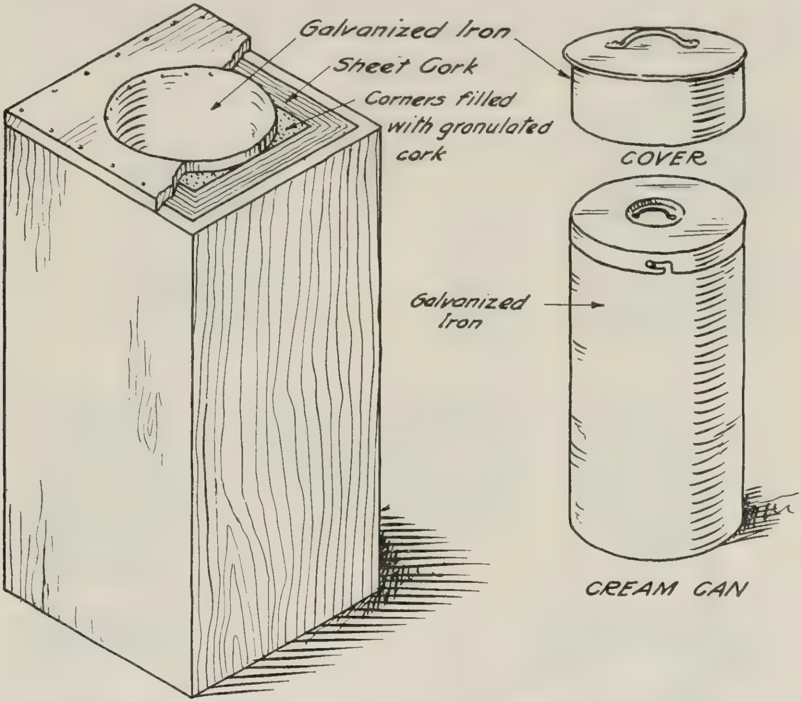
Where no separator is used, setting the milk in deep cans immersed in cold water is the best system. Setting in shallow pans or crocks is always a poor method, as it is difficult to cool the milk in this way, and the loss in skimming is greater. The dilution separator—that is, one in which water is added to the milk, the whole allowed to stand for a few hours, and the skim-milk-water mixture drawn off, does not take the fat out any clearer than does the deep-setting system, and the skim milk is not nearly so valuable as a calf food. All things considered it will pay any one having two or more cows to secure a centrifugal separator.



Creaming by deep setting

After being separated the cream should be placed in cold water and kept cool, until enough has been secured to make a churning; it should not, however, be allowed to freeze. It is better to have cans of proper size to hold the cream from each milking and not mix until ready to ripen. The cream should be kept fresh and sweet till this time. In order to have cream of this sort, it must be stored in a clean place. A small milk house built above ground, with light and ventilation, clean, smooth walls and ceiling, cement floor and water tank for storing the cream, is the ideal location for separating, cooling, storing and churning. Cellars are rarely fit places for this sort of work as they are used for a variety of other things such as the storing of vegetables, the odors from which are readily absorbed by the milk. They are rarely well lighted or ventilated and mould is usually abundant in them. A small milk house need not be expensive to be effective, and will pay both in convenience of labor and in the better quality of the product.

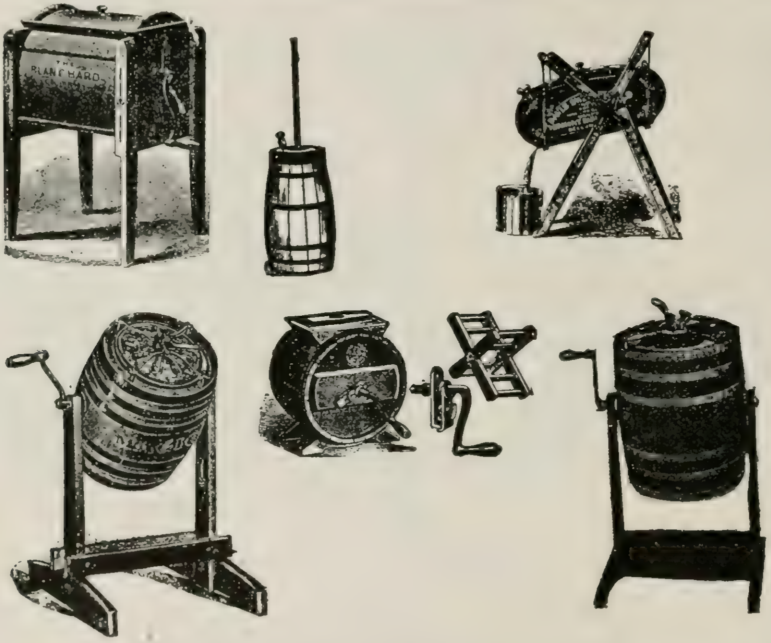
When the cream is ready to ripen, it should be removed from the cold storage vat, placed in a tub of hot water, stirred occasionally, and allowed to remain there until it has reached a temperature of 70 degrees. Use a thermometer to determine the temperatures. The lactic-acid bacteria develop rapidly at 70 degrees, and this is the action desired. The cream should be soured ready for churning in as few hours as possible. As souring is brought about by the lactic-acid bacteria, conditions should be made favorable for their rapid multiplication. In order to hasten bacterial action, the creamery butter-maker adds to the cream which he desires to ripen, a culture containing these bacteria in large quantities. These cultures are prepared in a commercial way and sold for use as starters. Their use is not practical in farm butter-making.



A cream-ripening can arranged on the same principle as a fireless cooker in order to keep even temperture.

If the milk and cream have been properly handled, souring will take place readily without the use of a starter. A temperature of 70 degrees should be maintained during the ripening period. This is often difficult to do, as in winter the temperature of the cream will ordinarily be colder than this and in summer, warmer. A very convenient and simple method of maintaining a uniform temperature is by a modification of the fireless cooker. This can be easily made at home at small expense. A box about four inches wider and longer than the cream-ripening can should be made, a sheet iron tube of the same length as the ripening-can and large enough that the can will just slip inside of it procured and hay, wool, cotton, excelsior, or some other non-conductor of heat packed closely in the bottom, and between the sides of the box and the sheet-iron tube. A small pad or cushion of the packing material should be made to cover the top of the can, and the whole covered by the lid of the box. This can be built entirely at home; the sheet iron tube should not cost over fifty cents. If the cream is heated to the proper temperature and placed in this box, it can be kept in the kitchen or other convenient place about the house and the temperature maintained with very little variation.

One of the common sources of poor butter is the old fashioned cream jar that stands behind the kitchen stove, into which the freshly drawn strippings are strained, and the cream poured each time after skimming. The churning is often made up of several batches of cream and strippings, some of which may be several days old before churning. Kept near the kitchen stove, the temperature is often too high, both for storage and proper ripening, and hence part of the cream becomes too sour and also develops an old flavor. This is due to the fact that the temperature has been so high that the putrefying bacteria have developed and attacked the organic matter in the cream. It is often said that it is impossible to make good butter from the milk of one cow. This is not true, provided the cream has been kept in a cool place and warm cream has not been mixed with it. Cream may be several days old and yet make good butter, if it has been kept at a low temperature, in a clean can or jar, and in a proper place.



Common types of churns. The lower ones are preferable.

When the cream has begun to thicken, it is ready to churn. It should be removed from the place of storage and placed in cold water to cool it down to the churning temperature. The proper temperature for churning will depend upon the thickness of the cream. The thinner the cream, the higher the churning temperature. Churning should require about thirty minutes, and a temperature to obtain such results should be secured before beginning. A little practice will be needed to determine this temperature. Where a separator is used, turned at the same speed each time, with milk of the same richness and temperature, the richness of the cream will be fairly uniform. Increasing the speed of the machine and the richness of the milk, and lowering the temperature of the milk increases the richness of the cream. By maintaining conditions so as to secure a uniform grade of cream, the temperature of churning can be determined, and, by cooling to this temperature, guessing can be avoided.

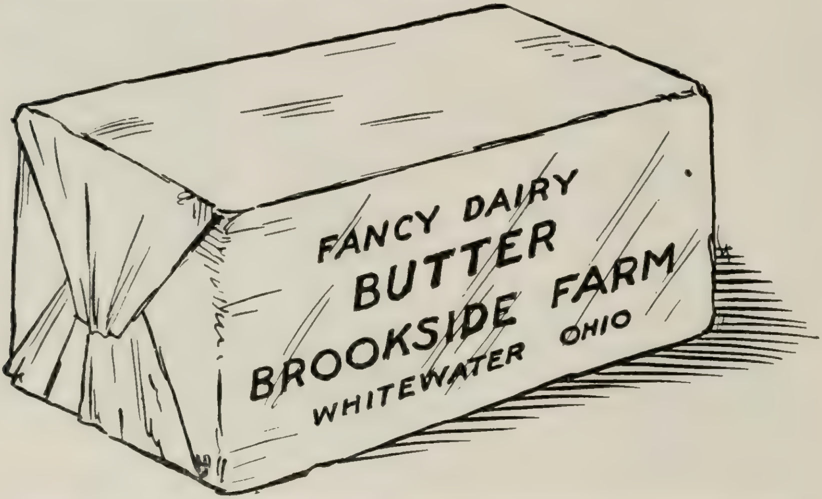
The kind of churn used is of no great importance so far as quality of butter is concerned. Other conditions are more important than this. However, the churn that brings the butter in two to five minutes should be avoided as should also one that has many interior fixings. A plain simple barrel or box with no dashers is best. Such a churn is easily cleaned and sterilized, while those with paddles, dashers, etc., are difficult to keep in a proper condition. The old dash churn may be used with as good results as any other, but it is not as convenient. Where such a churn is used, a hole should be bored near the bottom, from which the buttermilk can be drawn.

When the granules of butter are as large as a grain of wheat, the buttermilk should be drawn off through a fine-meshed sieve so that all butter particles will be caught. A pail of clean, cool water should be added to the butter, the churn rotated a few times, the water drawn off and another pailful added, this process being repeated until all the buttermilk has been washed out. Salt should be added to suit the taste of the customer, the churn again rotated a few times, and the butter removed from the churn. It should be worked just enough to mix the salt through it thoroughly. Too much working spoils the grain of the butter. It should be colored to meet the requirements of the trade.

The quality of butter depends upon the care of the churn, which should be scrubbed out throughly with warm water containing a washing powder. A stiff brush should be used for the purpose so that all cracks are throughly freed from particles of buttermilk. The churn should be rinsed with cold water, a pail of boiling water then poured in, the cover put on loosely, and the churn rotated a few times. This will force the steam into all the cracks. The churn should also be sterilized in this way just before churning. It should be well drained and kept in a well-ventilated place. A damp cellar is an improper place to store it.

The selling price of butter will depend upon the form in which it is marketed as well as upon the quality of the article. A neat attractive yet plain package will often bring as much as four cents more on the pound than an unattractive one. The grocery trade prefers a one pound brick to any other style of package. This is also a good form for a private trade. These bricks should be wrapped in regular parchment butter-paper and may then be placed in a folding paste-board carton on which the names of the maker and his farm have been printed. A good article should always be put out in an attractive form. This will catch the eye of the discriminating buyer who is ready to pay a good price for what he wants. A poor package gives the impression of carelessness. Large rolls should always be avoided. Small crocks may be used for a private trade, but they are more difficult to handle than prints.

The equipment used for the dairy work need not be very elaborate in order that butter-making may be successful. The skill of the butter-maker counts for more than the equipment. A separator, however, is a real necessity and should be found in every farm dairy where two or more cows are kept. The size of machine may be in proportion to the number of cows kept, but the larger sizes are more economical of time. The separator should be securely fastened down on a solid, level base. The bearings should be kept well lubricated and properly adjusted. A very slight wobbling of the bowl will cause a waste of fat in skimming and, also shorten the life of the machine, which should be properly put together and run at the required rate of speed.



Butter put up in a neat, attractive package catches the eye of the discriminating buyer and sells at the highest price.

A supply of cans for caring for the cream should be provided. These should be used exclusively for milk or cream. One large cream ripening can, with a fireless cooker made to fit it, will be another useful adjunct to the dairy equipment. For working the butter, a large bowl may be used and will be found satisfactory where there are only a few pounds to the churning. If churnings are large, it will be better to have a butter-maker of some simple sort. A pound print is needed and also a supply of parchment paper for wrapping the prints. An accurate thermometer is required. A well made, simple churn is cheaper and better than any other sort. If power is available, it should be provided with a pulley wheel for power attachment.

Where a dozen or more cows are kept, power of some sort will be found very economical. A small gasoline engine will furnish this at a low cost. Separator and churn can be connected to it and the labor greatly reduced. In dairies this of size, a small boiler (five or six horse-power) is very useful and inexpensive. Steam and hot water are necessities about the dairy for washing and sterilizing utensils. Steam can also be used to run the separator. In fact, a steam turbine machine is perhaps the most satisfactory sort of separator. A uniform pressure can be maintained and the speed of the machine regulated better than with either belt or crank power. Where a gasoline engine is used to run the the separator, a friction clutch pulley is needed to give a regular pull.

An abundance of clean, cold water is always a necessity in the dairy house. A never-failing spring is the ideal, giving flowing water about the cans of cream. Pure water is also required for cleaning utensils. The waste water from the dairy house should be carried by a good sewer far enough away to prevent any contaminating germs or odors returning to the room where the milk is stored and churning is done.

All these details may seem unnecessary and unprofitable, yet they are required for the best results, and only the best farm butter is wanted on the markets. The low priced grades are always unprofitable. The equipment for doing the work may be inexpensive, but the little details of care must not be neglected. There is a demand from the best city trade for this high grade butter and a market for it can be readily found. The butter from some of the best dairy farms in the country is shipped long distances to reach this trade. In this way, very profitable dairying may be done in districts remote from markets, and the cows kept on the farm will become one of the leading sources of income, rather than an unprofitable side line.

A tree which has been delivered into the hands of a butcher

A Progessive Township High School

Washington township high school, Mercer county, Ohio, is one of the progressive schools of the state and is a fine example of what a man with an ideal can do. The man is Superintendent W. S. Younger and his ideal is a school that serves the best interests of the people of the township. Here is what has been accomplished: Organized in September 1909, as a first grade school, it has developed into a social center as well as an educational center of the community which it serves. The enrolment includes 27 boys and 18 girls, or about ten per cent of the total school enumeration of the township. Three four-year courses are given, viz., college preparatory, scientific and commercial. The building is lighted with a gasoline lighting system, and is equipped with a good piano, chemical and physical laboratories, and a library of 1,000 volumes. All pupils are members of the Ohio Pupils Reading Course. There is a good barn, 30 by 100 feet, in connection with the school which accommodates forty horses and buggies. There is a high school orchestra and a strong athletic department, including two baseball teams, a football team and two girls' basket ball teams. All teams are well equipped and uniformed. Annual field day exercises are held and each winter the school conducts a high grade lecture course, which interests the parents as well as the pupils.

Elementary Agriculture and Home Economics.

SUMMER SESSION—OHIO STATE UNIVERSITY June 16—August 8, 1913.

COURSES FOR TEACHERS.

While no credit toward a degree will be given for work done in Elementary Agriculture, a certificate stating the courses carried will be given to each student who successfully completes at least five of the six courses.

Animal Husbandry	Mr. Palmer
Farm Crops & Grain Judging	Mr. Grant
Horticulture	Mr. Cruikshank
Dairying	Professor Erf
Soil Fertility	Mr. Bachtell
Home Economics	Misses Miskimen and Matthews

Each course will consist of either two or three lectures, and two laboratory periods a week.

The lecture hour will be utilized to give the student a general idea of the principles involved in the subject. It will also give opportunity for questions which arise from the student's reading or experience.

The laboratory period will give the student opportunity to actually perform with his own hands the various tests and experiments connected with the subject studied. He will judge live stock; select and test seeds for germination and purity; graft, prune and spray trees; test milk and make butter; and make mechanical tests of soils.

Home Economics

MISS MISKIMEN, MISS MATTHEWS

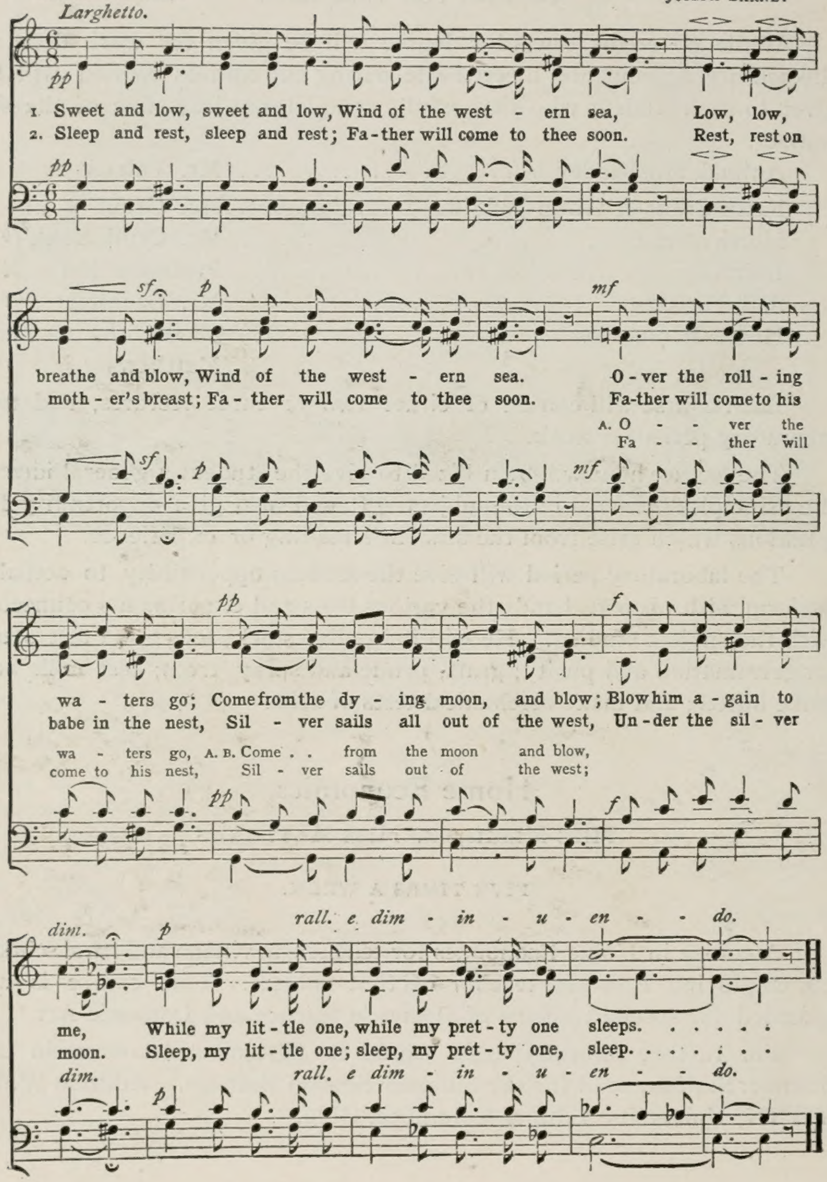
FIVE TIMES A WEEK.

A course in Home Economics for teachers in village and rural schools not employing a special teacher of that subject. This course is not intended for special teachers of Domestic Science and Domestic Art.

For further information in regard to Agricultural courses in the Summer Session, send for the Summer Session Bulletin. Address W. E. MANN, University Editor, Columbus, Ohio.

SWEET AND LOW

Alfred Tennyson — **Joseph Barnby**


Larghetto.
pp
1 Sweet and low, sweet and low, Wind of the west - ern sea, Low, low,
2. Sleep and rest, sleep and rest; Fa - ther will come to thee soon. Rest, rest on
sf
p
breathe and blow, Wind of the west - ern sea. O - ver the roll - ing
moth - er's breast; Fa - ther will come to thee soon. Fa-ther will come to his
mf
A. O - - ver the
Fa - - ther will
wa - ters go; Come from the dy - ing moon, and blow; Blow him a - gain to
babe in the nest, Sil - ver sails all out of the west, Un - der the sil - ver
wa - ters go, A. B. Come . . from the moon and blow,
come to his nest, Sil - ver sails out of the west;
f
dim.
rall. e dim - in - u - en - - do.
me, While my lit - tle one, while my pret - ty one sleeps. . . . . .
moon. Sleep, my lit - tle one; sleep, my pret - ty one, sleep. . . . . . .
dim.
rall. e dim - in - u - en - - do.